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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/729,694	12/06/2000	Gang Yang	57042-024	6844

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600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER

PATHAK, SUDHANSHU C

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/729,694	Applicant(s) YANG ET AL.	
	Examiner Sudhanshu C. Pathak	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on July 29<sup>th</sup>, 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 27 and 30-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on March 26<sup>th</sup>, 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 27 & 30-39 are pending in the application.
2. Claims 1-26 & 28-29 have been canceled.

### ***Response to Arguments***

3. Applicant's arguments filed on July 29<sup>th</sup>, 2005 have been fully considered but they are not persuasive.

In regards to the arguments presented regarding "Claim 27" Tayloe discloses performing location finding of a mobile station in a cellular system that includes a cell-site signal coverage profile (Abstract, lines 8-11, 14-27 & Fig. 1, element 103, 108, 113 & Column 3, lines 45-50 & Column 6, lines 29-32). Tayloe also discloses determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement (Column 2, lines 38-68 & Column 4, lines 22-51 & Column 5, lines 18-35, 55-67 & Column 6, lines 1-11 & Fig.'s 2-5). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention that a coverage map and a coverage profile are considered the same. Furthermore, Tayloe teaches measurement of signal strength at the base station to determine the mobile station position (Column 3, lines 46-50). Tayloe also discloses determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement

(Column 2, lines 38-68 & Column 4, lines 22-51 & Column 5, lines 18-35, 55-67 & Column 6, lines 1-11 & Fig.'s 2-5).

4. In regards to the arguments presented regarding "Claims 30-39", the new claims present additional limitations, which required new rejections. Furthermore, in response to the arguments presented even though the references relate to various different wireless standards i.e. CDMA, TDMA, DECT etc. all the wireless standards perform the function of hand-off, and therefore, it would indeed be obvious to one of ordinary skill in the art at the time of the invention that the process of hand-off is essential in a wireless communication system (of any protocol or antenna configuration) to provide mobility in the communication network. Furthermore, it would be obvious to one of ordinary skill in the art at the time of the invention that hand-off is performed based on monitoring one of various parameters of the received signal strength (any signal characteristic) such as received signal strength indicator (RSSI), signal-to-noise ratio (SNR) etc. Furthermore, Shen (5,952,963) teaches implementing the selection of antenna from a diversity of antennas, criteria based on the gradient error vector wherein the vector represents the magnitude of the received signals rate of change (Abstract, lines 25-28 & Column 4, lines 9-14), and this can be implemented in the communication system as described in Webb in view of Schulz so as to initiate hand-off before the signal quality declines and avoid complete loss of communication. Furthermore, Shen discloses a selecting between multiple antennas and Webb discloses selecting between two different serving sectors or

between two adjacent cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that antenna diversity as described in Shen can be implemented in the communication system as described in Webb in view of Schulz so as to provide increased reliability in a noisy environment and therefore an additional selection between antennas within the same serving antenna.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Webb et al. (4,485,486) in view of Schulz (6,611,511) in further view of Shen et al. (5,952,963) in further view of Tayloe et al. (5,023,900).

Regarding to Claim 27, Webb discloses a computer readable medium (Fig. 2, elements 358, 362-366, 352-356 & Column 5, lines 45-68 & Column 6, lines 3-19) bearing instructions for controlling plural sector antennas of a smart antenna system (Fig. 3a-d & Fig. 4 & Column 8, lines 12-49) wherein said instructions being arranged to cause one or more processors upon execution to perform steps comprising recording signal strengths received at one or more of the plural sector antennas from the mobile station (Abstract, lines 19-27 & Column 5, lines 9-13); calculating the rates of signal changes from the recorded signal strengths (Abstract,

lines 19-27, Column 2, lines 57-68 & Column 5, lines 9-20 & Fig. 3a, elements 402-418 & Column 8, lines 12-68); assessing the movement of the mobile station based on the calculated rates (Column 5, lines 9-44 & Fig. 3a-d & Column 2, lines 57-68); determining when the signal strength received at one antenna from the mobile station reach a pre-determined threshold and further performing hand-off of the mobile station when reaching of a predetermined threshold is so determined (Fig. 3a-d & Column 2, lines 57-68 & Column 5, lines 9-44 & Column 8, lines 12-68). However, Webb does not explicitly disclose selecting the hand-off controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes and performing location finding of a mobile station with a cell-site signal coverage area.

Schulz discloses selecting hand-off by the mobile station by assessing the movement of the mobile station (Column 3, lines 30-50, 61-67 & Column 4, lines 1-21 & Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schultz teaches selecting hand-off based on the assessment of the movement of the mobile station and this can be implemented as a criterion for hand-off in any cellular communication system. Furthermore, hand-off is inherently based on the assessment of the movement of the mobile station in any cellular communication system, as the mobile station moves from a different sector or to a different cell and the assessment is based on measuring various system parameters. However, Webb in view of Schulz does not explicitly disclose controlling the hand-off based on the calculated rates of signal changes.

Shen discloses a method and apparatus for selecting an antenna from a diversity of antenna in a wireless communication system (Abstract, lines 1-2 & Column 1, lines 15-35). Shen also discloses implementing the antenna selection based on the received signal strength indicator (RSSI) (Column 2, lines 22-36 & Column 4, lines 25-42). Shen further discloses implementing the selection criteria based on the gradient error vector wherein the vector represents the magnitude of the received signals rate of change (Abstract, lines 25-28 & Column 4, lines 9-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Shen teaches implementing a selection criteria for selecting an antenna based on the rate of signal changes and this can be implemented in the system as described in Webb in view of Schulz so as to initiate hand-off before the signal quality declines and avoid complete loss of communication. However, Webb in view of Schulz in further view of Shen does not disclose performing location finding of a mobile station with a cell-site signal coverage area and determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement.

Tayloe discloses performing location finding of a mobile station in a cellular system that includes a cell-site signal coverage profile (map) (Abstract, lines 1-11, 14-27 & Fig. 1 & Column 5, lines 18-35 & Column 6, lines 1-11 & Fig.'s 2-5). Tayloe also discloses determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal

coverage profile along with its predicted movement (Column 2, lines 38-68 & Column 4, lines 22-51 & Column 5, lines 18-35, 55-67 & Column 6, lines 1-11 & Fig.'s 2-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Tayloe teaches performing location finding of a mobile station with a cell-site signal coverage area and determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell-site signal coverage profile along with its predicted movement and this can be implemented in the cellular system as described in Webb in view of Schulz in further view of Shen so as to provide the system operator with the information of the mobile unit so as to optimize the coverage of the system during various heavier and or low load traffic conditions.

7. Claims 30-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb et al. (4,485,486) in view of Schulz (6,611,511) in further view of Shen et al. (5,952,963).

Regarding to Claim 30, 33-39, Webb discloses performing a hand-off of a mobile station in a cellular system that includes a smart antenna system of plural sector antennas (Abstract, lines 1-4, 19-27 & Fig. 1-2 & Column 1, lines 25-40 & Column 4, lines 48-62) comprising linked base stations (Fig. 1 & Column 4, lines 4-65) further comprising a plurality of sector antennas (Abstract, lines 19-27 & Column 4, lines 48-65 & Column 6, lines 45-50), spread spectrum transmitters configured to transmit spread-spectrum signals from any one of a plurality of sector antennas (Fig.'s 1-2 & Column 4, lines 40-64 & Column 5, lines 51-68), spread spectrum receivers



configured to receive signals from the mobile stations by the plurality of sector antennas (Fig.'s 1-2 & Column 4, lines 40-64 & Column 5, lines 51-68), and a controller (Fig. 1, elements 112, 122, 132 & Fig. 2, element 358 & Column 5, lines 9-25 & Column 6, lines 3-32 & Column 7, lines 32-42) configured for: recording signal strengths received at one or more of the plural sector antennas from the mobile station (Abstract, lines 19-27 & Column 5, lines 9-13); monitoring the signal strength changes (degradations) from the recorded signal strengths (Abstract, lines 19-27, Column 2, lines 57-68 & Column 5, lines 9-20 & Fig. 3a, elements 402-418 & Column 8, lines 12-68); assessing the movement of the mobile station based on the monitored signal strengths (Column 5, lines 9-44 & Fig. 3a-d & Column 2, lines 57-68); determining when the signal strength received at one antenna from the mobile station reach a pre-determined threshold and further performing hand-off of the mobile station when reaching of a predetermined threshold is so determined (Fig. 3a-d & Column 2, lines 57-68 & Column 5, lines 9-44 & Column 8, lines 12-68). Webb further discloses hand-off comprising a hand-off between two different sector antennas serving two different sectors and a hand-off between two different two adjacent cells (Abstract, lines 19-27 & Column 5, lines 9-23). Webb further discloses the plurality of serving sectors cover a substantially contiguous geographical area (Fig. 1). However, Webb does not explicitly disclose receiving spread spectrum signals and selecting the hand-off controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes.

Schulz discloses selecting hand-off by the mobile station by assessing the movement of the mobile station (Column 3, lines 30-50, 61-67 & Column 4, lines 1-21 & Fig. 1). Schulz further discloses implementing the system in a CDMA (spread spectrum) cellular system (Fig. 3 & Column 7, lines 10-23 & Column 1, lines 35-67 & Column 2, lines 1-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schultz teaches a spread spectrum communication system and selecting hand-off based on the assessment of the movement of the mobile station and this can be implemented as a criterion for hand-off in any cellular communication system. Furthermore, hand-off is inherently based on the assessment of the movement of the mobile station in any cellular communication system, as the mobile station moves from a different sector or to a different cell and the assessment is based on measuring various system parameters. However, Webb in view of Schulz does not explicitly disclose controlling the hand-off based on the calculated rates of signal changes.

Shen discloses a method and apparatus for selecting an antenna from a diversity of antenna in a wireless communication system (Abstract, lines 1-2 & Column 1, lines 15-35). Shen also discloses implementing the antenna selection based on the received signal strength indicator (RSSI) (Column 2, lines 22-36 & Column 4, lines 25-42). Shen further discloses implementing the selection criteria based on the gradient error vector wherein the vector represents the magnitude of the received signals rate of change (Abstract, lines 25-28 & Column 4, lines 9-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention

that Shen teaches implementing a selection criteria for selecting an antenna based on the rate of signal changes and this can be implemented in the system as described in Webb in view of Schulz so as to initiate hand-off before the signal quality declines and avoid complete loss of communication.

Regarding to Claim 31, Webb in view of Schulz in further view of Shen discloses a method for performing hand-off of a mobile station in a cellular system wherein selecting handoff, comprising selecting between two different sector antennas or a between two adjacent cells or between two different sector antennas, is controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes as described above. Webb further discloses assessing the movement includes determining if the rate of change is indicative of tangential motion across an antenna sector or is indicative of radial motion within an antenna sector (Abstract, lines 19-27 & Column 5, lines 9-40).

Regarding to Claim 32, Webb in view of Schulz in further view of Shen discloses a method for performing hand-off of a mobile station in a cellular system wherein selecting handoff, comprising selecting between two different sector antennas or a between two adjacent cells or between two different sector antennas, is controlled in response to the assessment of the movement of the mobile station based on the calculated rates of signal changes as described above. Webb further discloses a step of determining when the signal strength reaches a predetermined threshold comprising determining when signal strength received at an antenna from the mobile

station reach a first predetermined threshold (Fig. 3d, elements 474 & Column 5, lines 9-44 & Column 12, lines 50-65 & Column 13, lines 3-14).

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

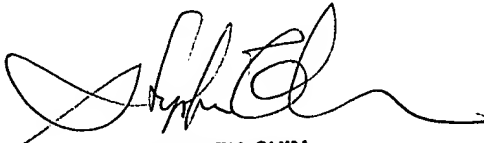
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
- The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak



**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2600**